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IS 4364 (1967): Pipettes, Serological [MHD 10: Medical Laboratory Instruments]



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IS : 4364 - 1967

Indian Standard
SPECIFICATION FOR
PIPETTES, SEROLOGICAL

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SPECIFICATION FOR PIPETTES, SEROLOGICAL

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Indian Standard

SPECIFICATION FOR PIPETTES, SEROLOGICAL

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 November 1967, after the draft finalized by the Medical Glass Instruments and Appliances Sectional Committee had been approved by the Consumer Products Division Council.

0.2 Preparation of standards on surgical instruments, medical equipment and appliances (including medical glass instruments), has been taken up at the instance of the Advisory Committee for Development of Surgical Instruments, Equipment and Appliances (Government of India).

0.3 Varied patterns and sizes of serological pipettes are in use in pathological work and this standard which covers the most popular types, sizes, etc, is expected to help in providing uniform equipment to all laboratories.

0.4 In the preparation of this standard, considerable assistance has been derived from the following:

IND/SL/MED/5836(b) Pipette, serological, graduated to deliver 0.25 cc. Ministry of Defence, Government of India.

B.S. 797 : 1954 Capillary pipettes. British Standards Institution.

B.S. 1428 : Part D 4 : 1963 Microchemical apparatus — capillary pipettes. British Standards Institution.

0.5 This standard is one of a series of Indian Standard specifications for medical glass apparatus. Other specifications published so far in this series are:

IS : 3740-1966 Tubes, glass for pathological work

IS : 3741-1966 Tubes, sedimentation

IS : 3742-1966 Pipettes, dilution for haemocytometers

IS : 4067-1967 Tube, swab (West type) for throat

IS : 4068-1967 Ureometer, Doremus type

IS : 4069-1967 Urinometer

IS : 4087-1967 Pipette for haemoglobinometer and blood pipette for biochemical work

IS : 4363-1967 Drip counter

0.6 Clause 7.1 of this standard calls for an agreement between the purchaser and the manufacturer permitting the purchaser to use his option for selection to his requirements.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements and the methods of tests for serological pipettes used in pathological work.

2. MATERIALS

2.1 The pipettes shall be made from clear, neutral, heat-resistant glass tubing (for definitions, see IS : 1382-1961†). The glass shall pass the alkalinity test prescribed in IS : 2303-1963‡ for Type 1 quality of glass.

3. CAPACITIES, SHAPE AND DIMENSIONS

3.0 The capacity corresponding to any graduation line is defined as the volume of water at 27°C, expressed in millilitres delivered by the pipette at 27°C when emptied from the zero line to that graduation line. It shall be determined as described in 8.1.

3.1 The pipettes shall be of the following capacities:

<i>Nominal Capacity</i>	<i>Subdivided into Scale Division</i>
ml	ml
0.1	0.005
0.2	0.01
0.5	0.02

3.2 Tolerance on capacity at 27°C shall be as given below; it shall represent the maximum error allowed at any point and also the maximum difference of errors between any two points tested:

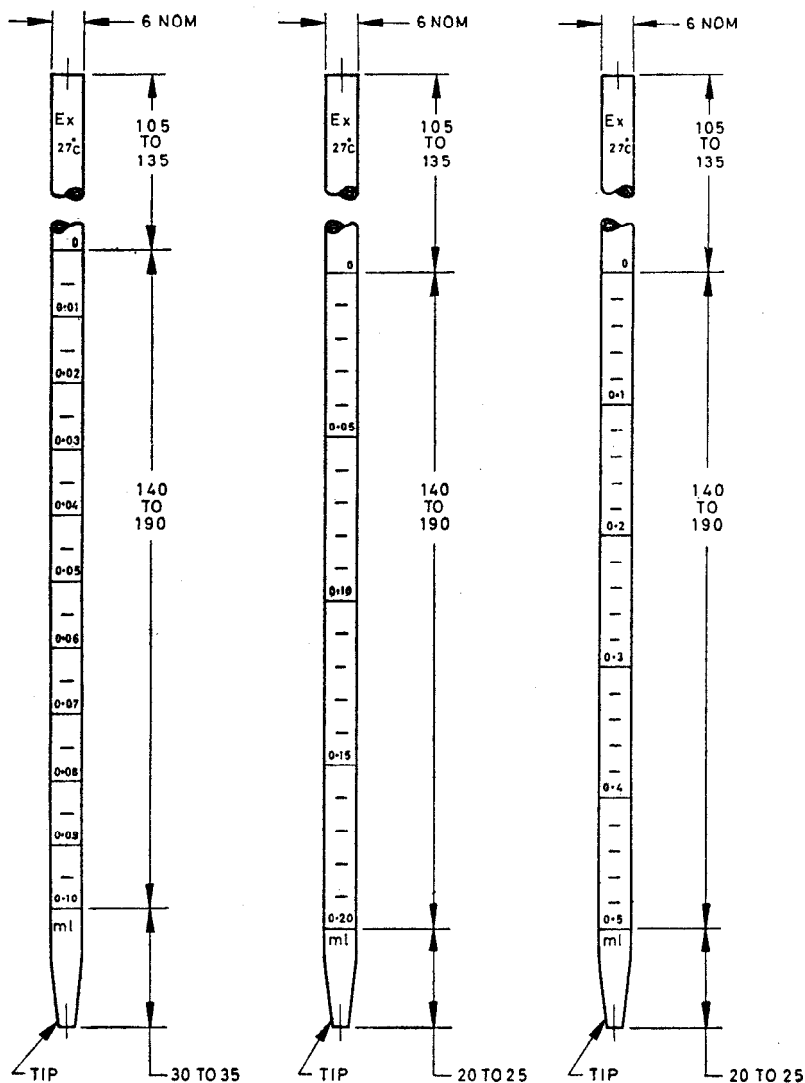
<i>Nominal Capacity</i>	<i>Tolerance</i>
ml	ml
0.1	±0.002
0.2	±0.004
0.5	±0.006

*Rules for rounding off numerical values (revised).

†Glossary of terms relating to glass industry.

‡Method of grading glass for alkalinity.

3.3 The shape and dimensions of the pipettes shall be as given in Fig. 1A and 1B.



All dimensions in millimetres.

FIG. 1A PIPETTES, SEROLOGICAL

4. WORKMANSHIP AND FINISH

4.1 The pipettes shall be well-annealed, free from bubbles, blisters, and as far as possible, from striae, stones, and other visible defects (for definitions, see IS : 1382-1961*). The pipette shall be symmetrical about its axis. The top of the pipette shall be ground smooth at right angles to its axis. The delivery jet shall be made with a gradual taper, which shall not have any constriction at the orifice. The end of the jet shall be ground smooth at right angles to the axis of the pipette, and shall be slightly bevelled at the periphery. The pipette shall pass the thermal shock test specified in 8.2 and dry heat test specified in 8.3.

5. GRADUATIONS

5.1 The graduations shall be fine, cleanly etched permanent lines of uniform thickness. They shall be parallel to each other and at right angles to the axis of the pipette. The graduation marks shall pass the permanency test specified in 8.4.

5.2 The scale shall be numbered and subdivided as shown in Fig. 1A. The main divisions shall be etched completely round the pipette and numbered.

*Glossary of terms relating to glass industry.

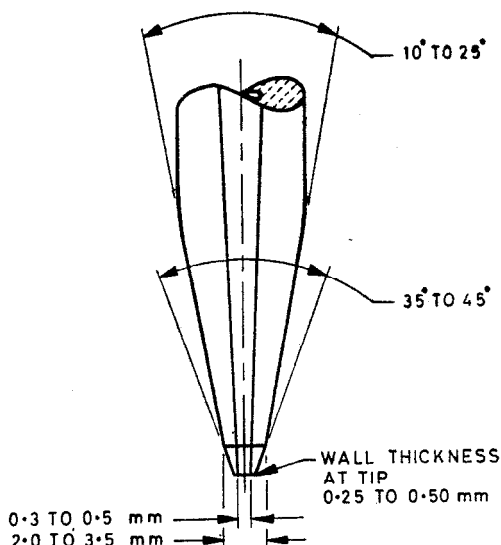


FIG. 1B DETAILS OF TIP (see FIG. 1A)

6. MARKING

6.1 The pipettes shall be marked legibly and permanently with the following:

- a) Name of manufacturer,
- b) Legend '27°C' to indicate that the pipette is calibrated at 27°C, and
- c) Inscription 'Ex' to denote that it is calibrated at 27°C for delivery.

6.2 Each pipette may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. PACKING

7.1 Each pipette may be enclosed in a cardboard carton, cushioned with cottonwool at both the ends or packed as agreed to between the purchaser and the supplier.

8. TESTS

8.1 Determination of Capacity

8.1.1 The pipette shall be cleaned thoroughly and distilled water sucked till the meniscus is a little above the graduation mark. The water level shall be kept at this position by pressing the top of the pipette firmly by a finger. All adhering water shall be wiped off the jet end of the pipette by a clean dry cloth. The pipette shall be held vertically and the meniscus allowed to fall slowly by releasing the finger pressure. The water shall be allowed to run out till the lowest point of the meniscus is in the horizontal plane containing the top edge of the graduation mark. Then the jet end shall be touched to the inside of a clean beaker to remove any adhering drop at the jet.

8.1.2 A clean, tared and weighed stoppered bottle (about 50 ml size beaker or any other convenient vessel may be used) shall be placed beneath the pipette and the tip of the jet of the pipette touched with the inside wall of the stoppered bottle. The rate of outflow shall be uniformly controlled by pressing the finger on to the top of the pipette until the water surface is

within 1 cm of the graduation line to be tested. The pressure of the finger shall be then increased so that an accurate setting can be made on the line. The time occupied by delivery of the total capacity shall be not less than 20 seconds and for smaller volume the minimum time of delivery shall be in proportion. The pipette shall then be removed. The stoppered bottle shall be reweighed with water and thus the weight of water delivered by the pipette determined. The volume of water delivered by the pipette at 27°C shall be calculated. Five such readings shall be taken.

8.1.3 The pipette shall be taken to have satisfied the requirement if the volume of water so obtained is within the tolerance prescribed in **3.2**.

8.2 Thermal Shock Test — The pipette shall be boiled in water for 30 minutes and then plunged in water at about 20°C. It shall not show any chipping or cracking.

8.3 Dry Heat Test — The pipette shall be subjected to a dry heat in a sterilizing oven at $180^{\circ} \pm 2^{\circ}\text{C}$ for 30 minutes. It shall show no deterioration in any way.

8.4 Permanency of Graduations — The pipettes shall be immersed in a chromic acid mixture of the following composition and kept there for 15 minutes:

Sodium dichromate	200 g
Water	1 000 ml
Sulphuric acid	1 500 ml

These shall then be rinsed thoroughly in distilled water and dried thoroughly. There shall be no fading of the graduation marks.

INDIAN STANDARDS INSTITUTION

The Indian Standards Institution (ISI), which started functioning in 1947, is the national standards organization for India. Its principal object is to prepare standards on national and international basis and promote their general adoption.

The overall control of ISI, which is run and financed jointly as a non-profit making body by the Government and private enterprise, is exercised by the General Council, composed of representatives of Central and State Governments; leading trade, scientific and technological organizations; and subscribing members. The Union Minister of Industry is the ex-officio President of ISI.

The present technical activity of ISI is carried out through 8 Division Councils for Agricultural and Food Products; Chemical; Civil Engineering; Consumer Products; Electrotechnical; Mechanical Engineering; Structural and Metals; and Textile; All technical work relating to the formulation and revision of standards is done by committees appointed by and under the direction of their respective Division Councils. These committees consist of experts drawn from manufacturing units, technical institutions, purchase organizations and other concerned bodies.

To make available benefits of Indian Standards to the common man, ISI has introduced its Certification Marks Scheme under the *Indian Standards Institution (Certification Marks) Act, 1952*, as amended by the *Amendment Act, 1961*. According to this Act, quality goods conforming to Indian Standards can carry the ISI Certification Mark. This Mark is a third-party guarantee of quality of marked goods. Licences to use the ISI Certification Mark are granted to manufacturers using reliable methods of quality control subject to overall inspection by ISI.

In the international field, ISI represents India on the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). ISO and IEC respectively link 54 and 40 countries, and function through 118 and 58 technical committees; ISI participates in 83 technical committees of ISO and all the technical committees of IEC. The committees and subcommittees of IEC and ISO for which ISI holds the secretariat deal with: Electric Fans, Lac, Mica, Pictorial Markings for Handling of Goods, Liquid Flow Measurements in Open Channels, Procedures for Inter-conversion of Values, Spices and Condiments, and Stimulant Foods.

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Agriculture & Food
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Civil Engineering
Consumer Products

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Mechanical Engineering
Structural & Metals
Textile

Of these, the standards belonging to the Consumer Products Group, at present, fall under the following categories:

Coir and Coir Products
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ISI Bulletin (Published Every Month)	
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INDIAN STANDARDS INSTITUTION

Headquarters

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 1

Telephones 27 36 11 - 20

Telegrams Manaksanstha

Branch Offices

Telegrams Manaksanstha

534 Sardar Vallabhbhai Patel Road
 5 Chowringhee Approach
 Industrial Estate Administrative
 Building, Sanatnagar
 117/418 B Sarvodaya Nagar
 54 General Patters Road

Bombay 7	Telephone	35 70 27
Calcutta 13	"	23-18 23
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